

(12) UK Patent Application (19) GB (11) 2 212 370 (13) A
(43) Date of A publication 19.07.1989

(21) Application No 8726191.3

(22) Date of filing 09.11.1987

(71) Applicant
Tiong Ee Ong
NRIC No 1094674, Singapore

(72) Inventor
Tiong Ee Ong

(74) Agent and/or Address for Service
Marks & Clerk
57-60 Lincoln's Inn Fields, London, WC2A 3LS,
United Kingdom

(51) INT CL.
A61L 9/20

(52) UK CL (Edition J)
H5R RBU
U1S S1185 S1272

(56) Documents cited
GB 2051771 A GB 1536397 A GB 1289150 A
EP 0220050 A2

(58) Field of search
UK CL (Edition J) H5R RBF RBU
INT CL. A61L, G01N

(54) Air purifying apparatus

(57) Air purifying apparatus particularly intended for use in medical and dental clinics, surgeries, rural hospitals and aircraft comprises a sterilising chamber (3) adapted for the admission and discharge of a current of air, and containing tubes by which ultra-violet radiation of different wave length ranges is emitted and reflected by at least one chamber wall so as thereby to irradiate and sterilise the air current. The apparatus may include a filter 4.

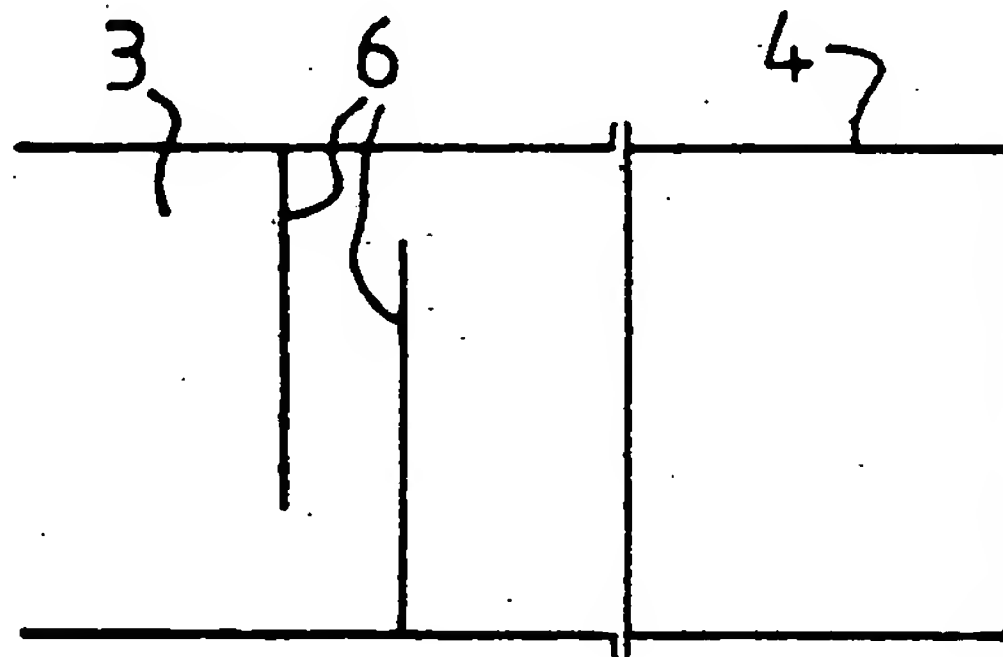


FIG. 6.

2212370

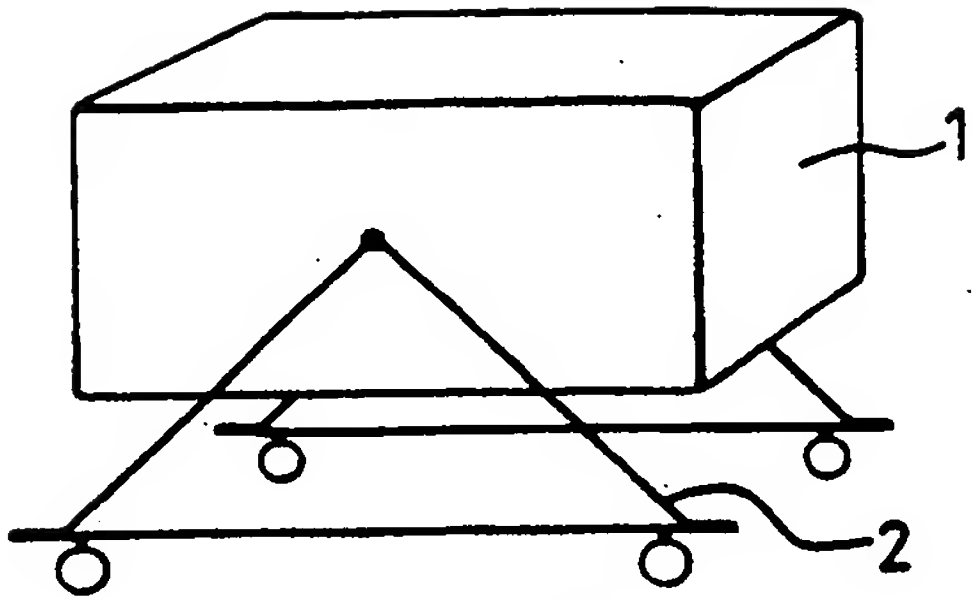


FIG. 1.

1/2

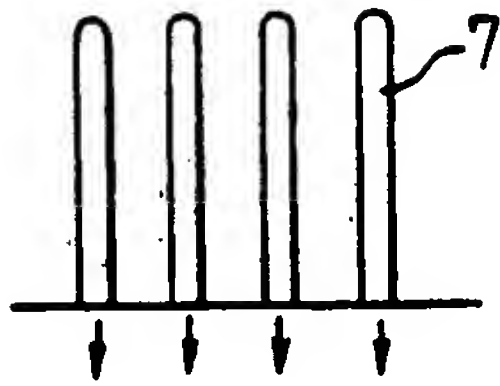


FIG. 2.

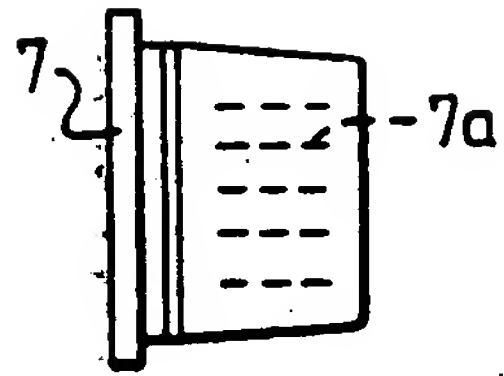


FIG. 3.

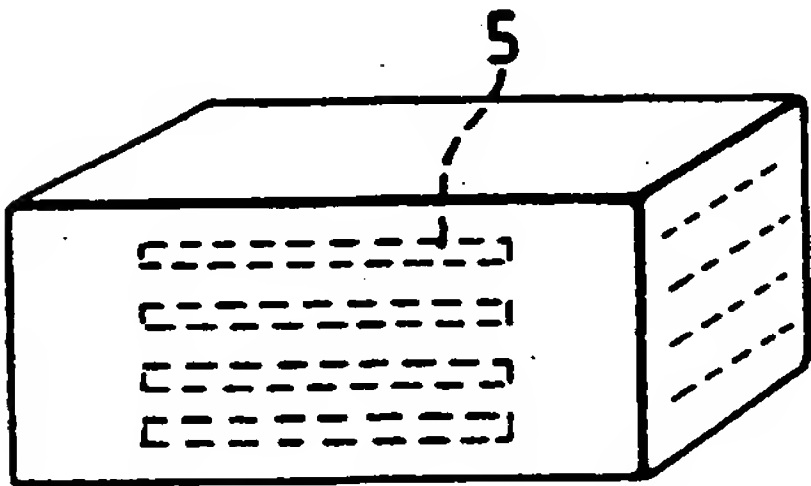


FIG. 4.

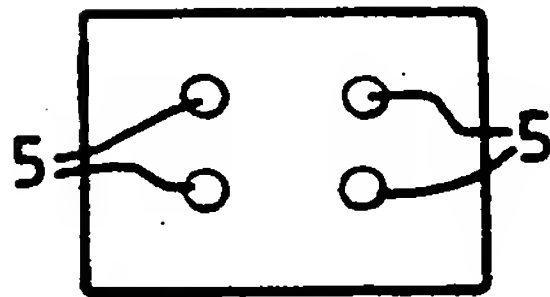


FIG. 5.

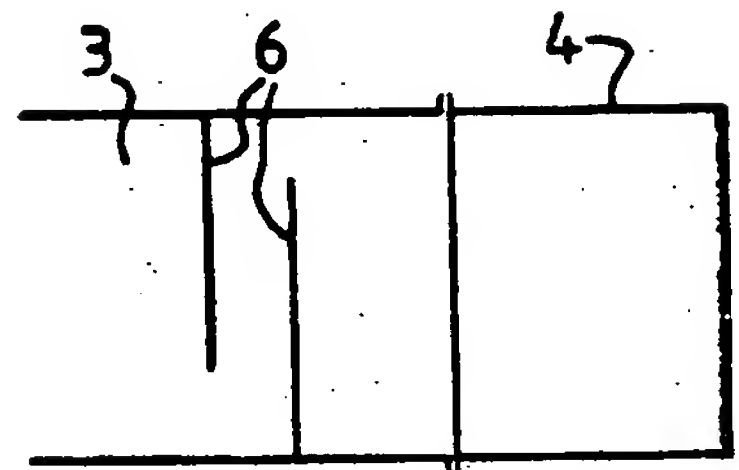


FIG. 6.

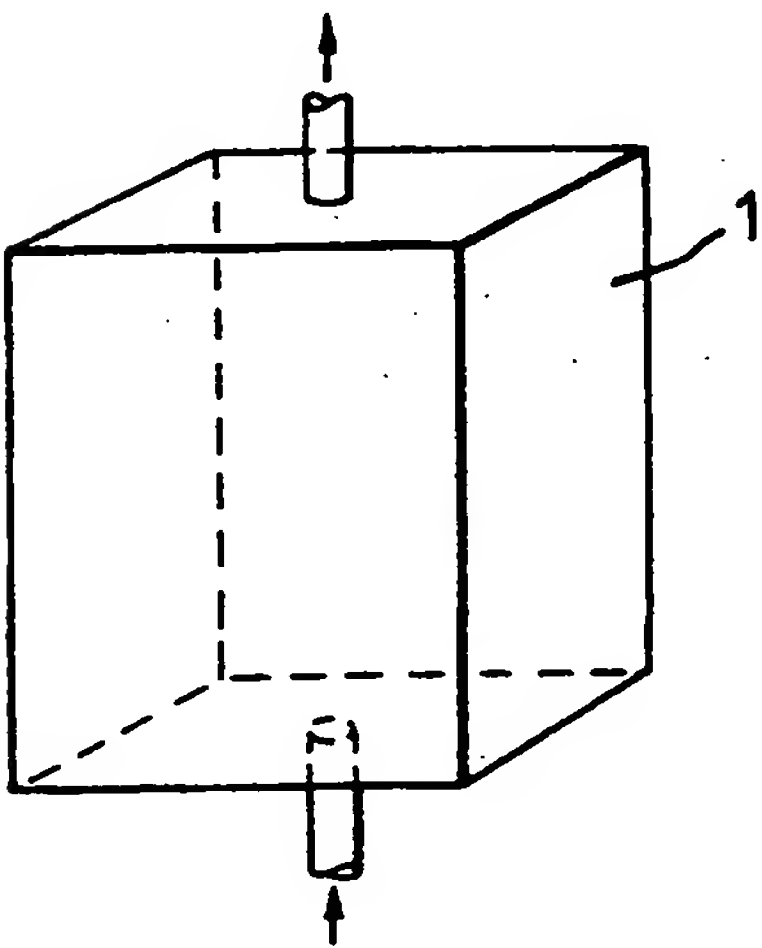


FIG. 7.

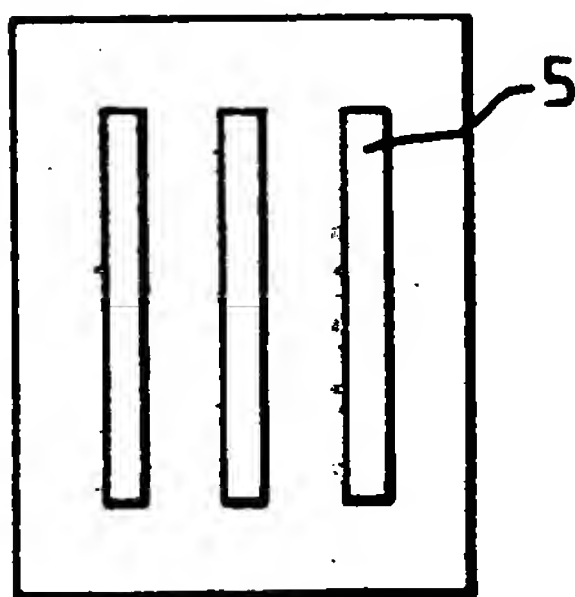


FIG. 8.

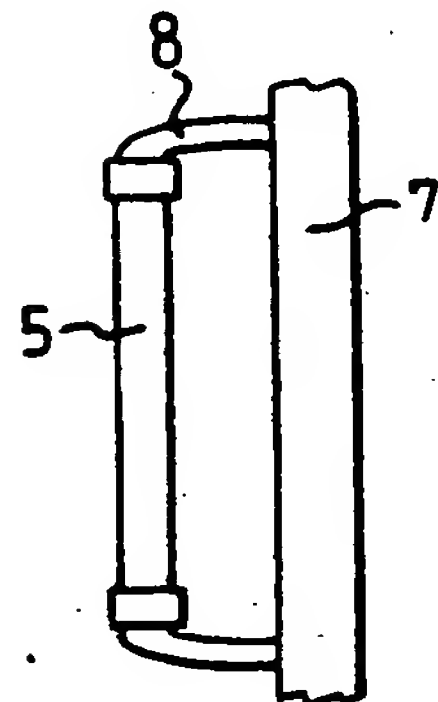
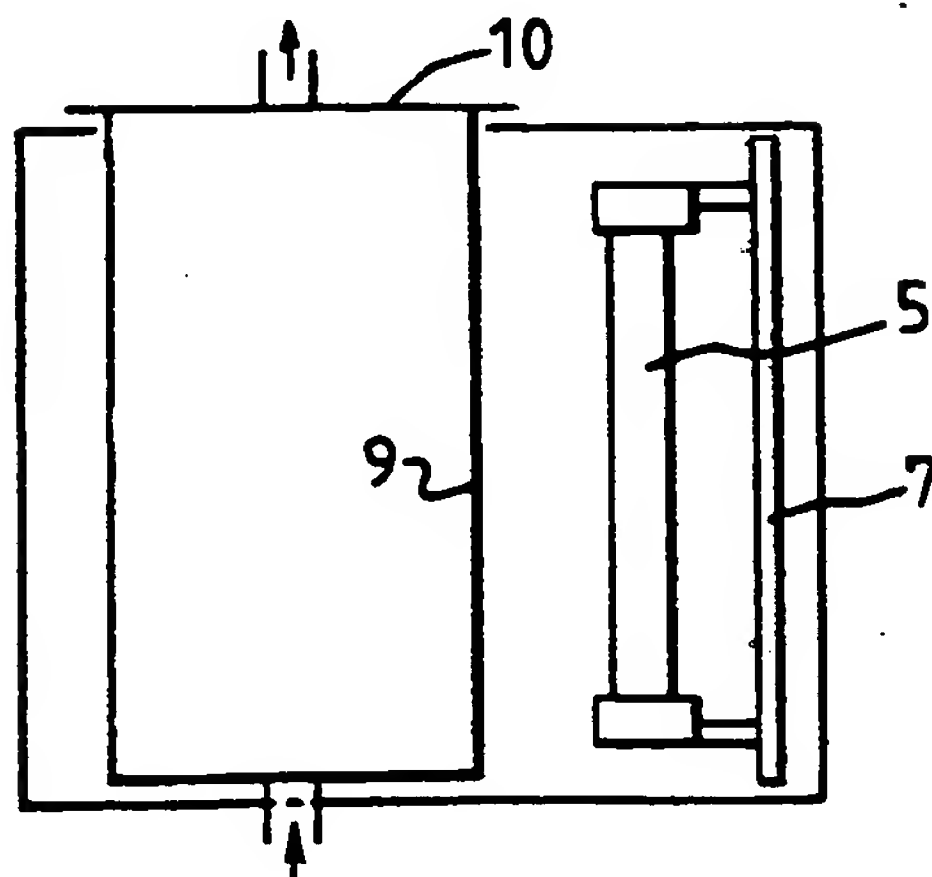


FIG. 9.

FIG. 10.



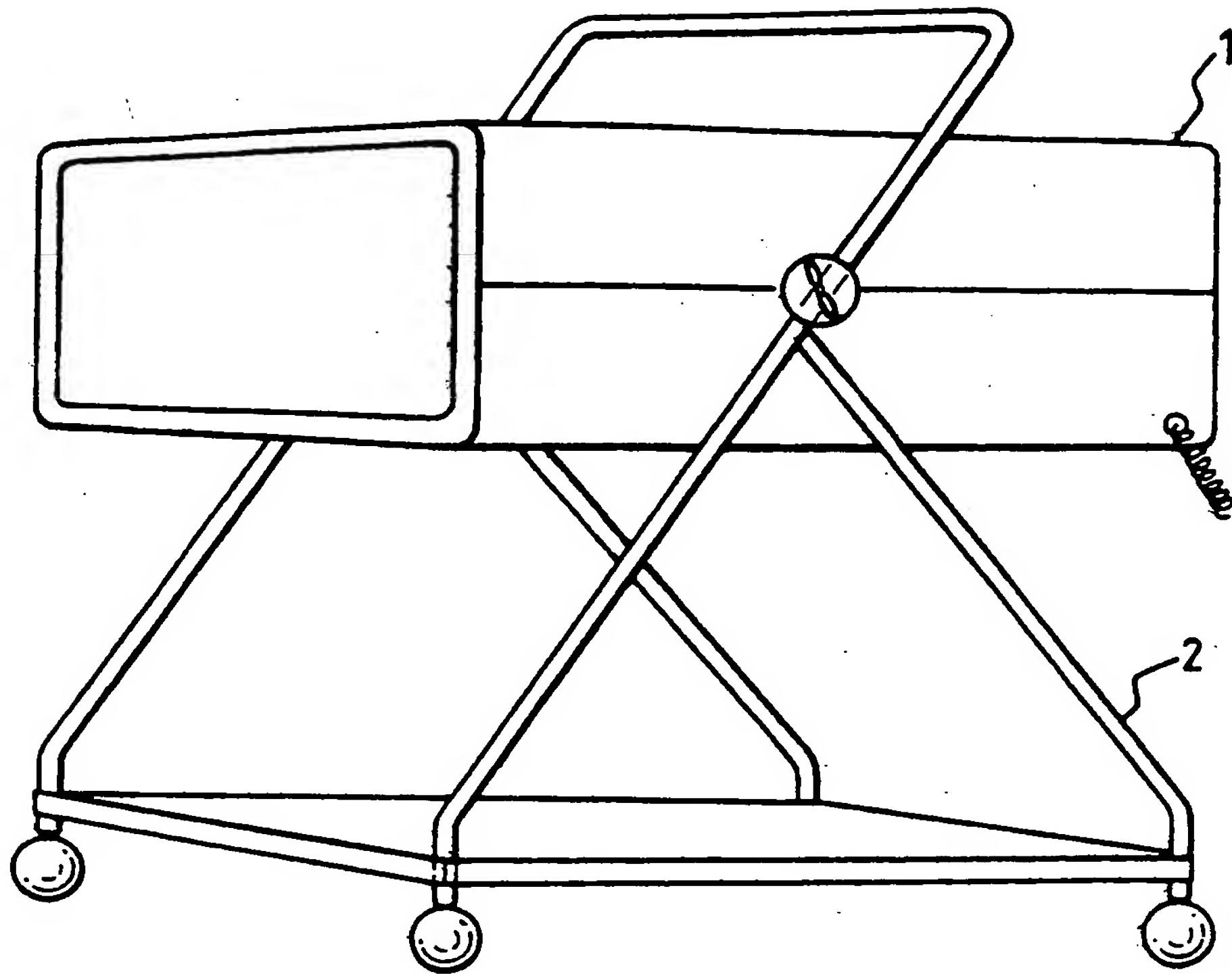


FIG. 11.

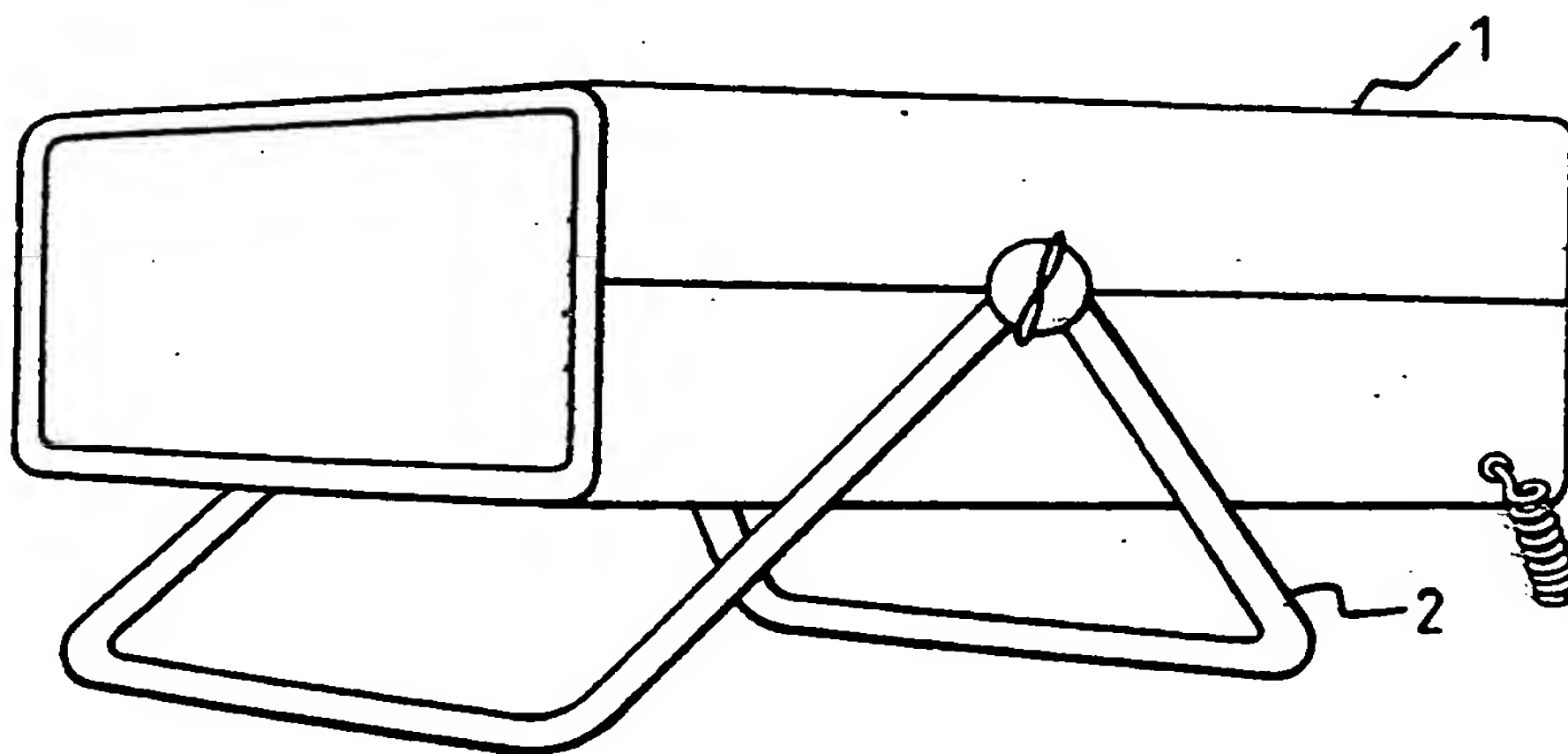


FIG. 12.

2212370

1

M&C FOLIO: 230P54850

WANGDOC: 0437L

"AIR PURIFYING APPARATUS"

This invention relates to an air purifying apparatus which is particularly intended for use in medical and dental clinics and surgeries and rural hospitals.

5 There is a need for such an apparatus because during their working life doctors and dentists and their assistants are forced to breathe the exhalations, whether breathed or sucked out, from the mouths of their patients. Accordingly a demand exists for a range of apparatus which are inexpensive, simple to maintain,
10 reliable and robust, which can:

(a) Purify air sucked from the mouths of dental patients by most common high-vacuum dental machines which often discharge the contaminated air into the air-conditioners in large
15 buildings;

(b) Improve the quality of air in doctors' consultation rooms by cycling room air through air purifying machines at a higher rate of air flow than is normal in large air-conditioned
20 buildings because of energy-saving requirements; and

(c) Purify the air in large air ducts in commercial buildings and hospitals by incorporating modular tubular light sterilising chambers into the ducting system to kill germs.

5 In accordance with the invention air purifying apparatus comprises a chamber adapted for the admission and discharge of a current of air, and containing tubes by which ultra-violet radiation of different wave length ranges is emitted and reflected by the chamber wall(s)
10 so as thereby to irradiate and sterilise the air current.

The apparatus may further and preferably comprise any or all of an activated carbon filter to remove disagreeable odour, a perfume dispenser and an air ioniser and may be mounted in various ways as
15 hereinafter described with reference to, and as shown in, the accompanying drawings in which:

Fig. 1 shows a typical apparatus mounted on a wheeled chassis;

20 Figs. 2 and 3 are respectively side and end elevations of suitable air filter elements;

Figs. 4 and 5 illustrate the disposition of ultra violet radiation tubes in an air flow chamber;

Fig. 6 shows the mode of juxtaposition of an air filter unit;

Figs. 7 and 8 respectively show an air chamber and ultra violet radiation tubes of wall-mounted air purification apparatus;

Fig. 9 shows the mode of mounting a back panel of the apparatus on a board;

Fig. 10 shows a second type of wall-mounted apparatus; and

Figs. 11 and 12 show two different modes of mounting of the apparatus.

In the mobile form of apparatus shown in Figs. 1 to 6 the component parts are contained within a rectangular casing 1 mounted on a four wheeled trolley 2. The casing has an air inlet and an air outlet and contains an air sterilising chamber 3 and an adjacent air filter unit 4. It also contains a fan for inducing flow of air into and out of the casing as well as vanes or partitions for guiding the flow of air within the casing.

The air chamber is conveniently of rectangular shape and has wall surfaces of aluminium or other metal which

is capable of reflecting ultra violet radiation with efficiency of up to as much as 85%.

5 The air chamber contains a set of two, four or six tubes 5 which emit ultra-violet radiation. One or more of these tubes emit radiation in the low frequency range - of the order of 260 mm which is most effective in destroying bacteria cells whilst one or more of the other tubes emit radiation in the high frequency range - wavelength 200 mm and below, bordering on x-ray radiation, which generates light. This is effectively absorbed by the air flowing through the chamber and converts oxygen molecules into free ozone - a strong oxidising agent which oxidises virus protein molecules and other contaminants, such as spores.

15 The air sterilising chamber 3 has high reflectivity baffles 6 at each end and the air filter unit 4 is comprised of a plurality of slot-in fin-type parallel flat filter elements 7. These elements are high quality moulded plastics material hollow fins with elongated perforations 7a. Replaceable external jackets filled with granular activated carbon are used.

25 The above described apparatus is particularly suitable for use in doctors consulting rooms and in larger sizes in hospitals or other buildings or public transport such as for instance aircraft. Instead of

having a trolley the casing could be adapted for mounting upon a wall. Power for the fan and the radiation tubes will normally be supplied from an external power supply through a cable connected to a distribution board within the casing.

A simplified version of the above described apparatus without the fan and air filter unit could suitably be used in aircraft.

CLAIMS

1. Air purifying apparatus comprising a chamber adapted for the admission and discharge of a current of air, and containing tubes by which ultra-violet radiation of different wave length ranges is emitted and reflected by at least one chamber wall so
5 as thereby to irradiate and sterilise the air current.
2. Air purifying apparatus as claimed in claim 1 in which an air filter unit is adjacent the chamber and located in a casing having an air inlet and an air outlet and which contains a fan for inducing flow of air into and out of the casing.
- 10 3. Air purifying apparatus as claimed in claim 1 or claim 2 in which the air chamber is of substantially rectangular shape and has highly reflective baffles therein.
4. Air purifying apparatus as claimed in claim 2, or claim 3 as dependent thereon, wherein the air filter unit comprises a
15 plurality of flat plastics material hollow filter elements.
5. Air purifying apparatus as claimed in any of claims 1 to 4 when mounted on a trolley, on a support stand or on a wall.
6. Air purifying apparatus substantially as hereinbefore described with reference to any one or more of the accompanying
20 figures of drawings.